

STUDIES IN AUSTRALIAN LAMIACEAE

1. THE GENUS *WRIXONIA* F. MUELL. (PROSTANTHEROIDEAE)

J. Carrick

State Herbarium, Botanic Gardens, North Terrace, Adelaide, South Australia 5000

Abstract

The genus *Wrixonia* comprises two species, *W. prostantheroides* F. Muell. from Western Australia, and *W. schultzi* (F. Muell. ex Tate) Carrick, comb. nov. from Northern Territory, for each of which a lectotype is chosen. A key is provided to distinguish the genus from the five other genera recognized in the Prostantheroideae. Both species are described and figured, and because of the very meagre original diagnosis, a more complete Latin description of the second is given.

The genus *Wrixonia*, established by F. Mueller in 1876, was so called in honour of Henry John Wrixon, for many years Minister of Justice in Victoria, and scholarly patron of the Arts and Sciences.

The material was collected by Jess Young in 1875, during the Giles Expedition, in the vicinity of Mount Churchman, Western Australia, and Mueller named the plant *W. prostantheroides* because of its resemblance to the genus *Prostanthera* Labill. in having entire calyx lips and a similar odour. The two upper stamens, however, are sterile, which distinguishes *Wrixonia* from *Prostanthera* in which all four stamens are fertile, and from *Microcorys* and *Westringia* in which the two lower stamens are sterile.

Mueller himself, however, expressed some doubt as to the validity of his new genus: "Planta, si intra Prostantheram inclusa, P. Wrixoni dicenda". Total or partial sterility of some or all anthers, and the presence or absence of appendages on the connectives, are major criteria in the separation of the genera of Prostantheroideae. Although a better knowledge of the range of variation within the genera may lead to a more natural grouping, it is, for the time being, considered justifiable to uphold Mueller's decision.

In 1886, from the summit of Mount Sonder, Northern Territory, Rev. W. F. Schwarz of the Hermannsburg Lutheran Mission collected vegetative specimens of a plant which Mueller annotated *Prostanthera schultzi*, presumably in honour of Pastor Louis Schulze, also of Hermannsburg. Mueller recorded it in his Census supplement 4 in 1889, as *P. schultzi*, and again in his Second Census in 1889, but with a change in spelling, as *P. schultzi*. There was an M. Schultz who collected in the Darwin area in the 1860s, but apparently he had no connection with L. Schulze, according to J. H. Willis in Victorian Naturalist, 86 (1969) 132. It is possible that Mueller confused them, though there appears to be no evidence of any connection between them.

Further collections from Mount Sonder, also not in flower or fruit, were made by Professor R. Tate in 1894 during the Horn Expedition. He listed it in a paper entitled "A Supplement to a Census of the Flora of Extra-Tropical South Australia" in Trans. R. Soc. S. Aust. 19 (1895) 82, retaining the "t". These three references are nomina nuda. In his "Account of the Botany of the Horn Expedition" (1896) 173, Tate cites Mueller's Second Census and quotes from correspondence with Mueller: "Differs from *P. rotundifolia* R. Br. in smaller, less crenate and thicker leaves", adding that flowers and fruit remain unknown, thus validating the specific epithet.

Cuttings sent to the Royal Botanic Gardens, Melbourne, in 1967, flowered in 1968. Because of the sterile upper stamens, Willis (loc. cit.) suggested that it belonged to the genus *Wrixonia*. The excellent flowering and fruiting material collected from Mount Sonder in 1972 (J. R. Maconochie 1653), because of its completeness, has been of particular value, and forms the basis of the present description.

The following key distinguishes *Wrixonia* from the other genera recognized in the Prostantheroideae. (Fig. 1).

1. Four stamens fertile..... 2
Two stamens fertile..... 4
2. Anthers 2-celled: connective prominent at back,
usually cristate and produced into 1 or 2 linear appendages..... *Prostanthera*
Anthers 1-celled: connective elongated and produced
beyond its insertion on the filament..... 3
3. Connective produced into a small tooth-like or shortly linear appendage..... *Hemiandra*
Connective produced into a sterile branch which in the upper pair
is usually short and dilated, and crested or bearded at the end,
in the lower pair (rarely in both pairs) is glabrous
and attenuate or bearing an imperfect cell at the end..... *Hemigenia*
4. Lower stamens fertile, anthers 2-celled, without appendages;
upper stamens sterile, bearing very small club-shaped heads *Wrixonia*
Upper stamens fertile, anthers 1-celled; lower stamens sterile,
anthers reduced to a small connective with 2 linear
or linear-clavate branches..... 5
5. Connective of the fertile stamens elongated,
produced below the insertion on the filament
into a short lower branch usually dilated
and bearded at the end..... *Microcorys*
Connective of the fertile stamens not, or very shortly,
produced below the insertion on the filament *Westringia*

WRIXONIA F. Muell.

F. Muell., *Fragm.* 10 (1876) 18; Durand, *Gen. Phan.* (1888) 329; Briquet, in Engler & Prantl, *Naturl. Pflanzenfam.* 4, 3a (1895) 219; Dalla Torre & Harms, *Gen. Siphon.* (1904) 435, no. 7224; Blackall & Grieve, *W. Austral. Wildfl.* 3 (1965) 575.

Intricately branched woody shrubs, up to 2 m high, leaves less than 1 cm long. *Inflorescence* racemose or spicate, more or less compact, terminal on short branchlets. *Bracts* broad, membranous. *Bracteoles* narrow-linear to narrow-lanceolate, well-developed or obsolescent, caducous. *Calyx* 2-lipped, 10-nerved, lips entire or somewhat sinuate, almost equal or the upper broader, closed in fruit. *Corolla* white, tube cylindric, expanded at the throat, upper lip deeply 2-lobed, lower lip deeply 3-lobed, the lobes broad, rounded and more or less emarginate. *Stamens* more or less exserted, lower pair fertile, 2-celled, upper pair sterile, with small, more or less club-shaped heads. *Ovary* glabrous, deeply 4-cleft, style slender, gynobasic, shortly bifid. *Nutlets* reticulate, attachment obliquely basal.

Type species: Wrixonia prostantheroides F. Muell.

Leaves deflexed, with undulate margins; inflorescence a raceme, more or less condensed 1 *prostantheroides*
Leaves spreading, more or less flat, margin thickened; inflorescence a very condensed spike..... 2 *schultzi*

1. *W. prostantheroides* F. Muell., *Fragm.* 10 (1876) 18; Cens. Austral. Pl. (1882) 101; Sec. Cens. Austral. Pl. (1889) 170; Briquet, in Engler & Prantl, *Naturl. Pflanzenfam.* 4, 3a (1895) 219; Gardner, *Enum. Pl. Austral. Occid.* (1931) 114; Beard, *West Austral. Pl.* (1965) 94; Blackall & Grieve, *W. Austral. Wildfl.* 3 (1965) 575.

Typus: J. Young s.n., "in vicinia montis Churchmani", 27.x.1875, MEL 502314, lectotypus hic designatus. Young's collection is now mounted on two sheets, MEL 502314

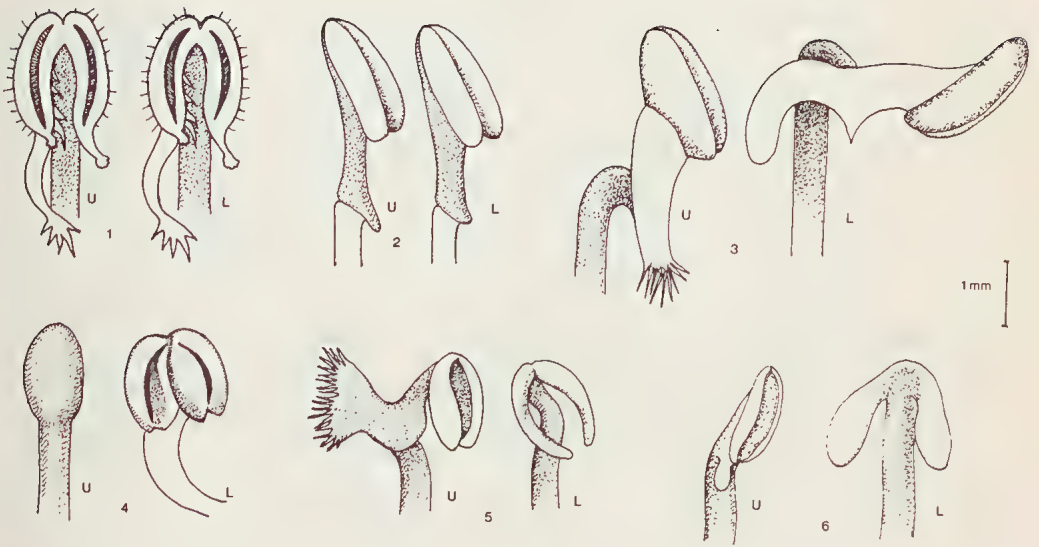


Fig. 1. Anthers of the genera of Prostantheroideae: U = upper, L = lower. 1, *Prostanthera lasianthos* Labill.; 2, *Hemiandra pungens* R. Br.; 3, *Hemigenia westringioides* Benth.; 4, *Wrixonia prostantheroides* F. Muell.; 5, *Microcorys obovata* Benth.; 6, *Westringia grevillina* F. Muell.

and MEL 502315. Both contain several twigs almost devoid of leaves and flowers and packets containing loose leaves and flowers.

Intricately branched undershrub up to 50 cm high, branches more or less patent and somewhat terete, ultimate branchlets short and spinescent, stems, leaves and calyces outside short white hairy or nearly glabrous, with small, sessile, circular glands. *Leaves* sessile or very shortly petiolate, cordate, rhomboid or orbicular, 1-4 mm long, deflexed, with undulate margin, concave above. *Inflorescence* terminal; lowest floral leaves gradually transformed distally into broad lanceolate or oblanceolate to ovate bracts, 2.5-5 mm long and 1.5-4.5 mm broad, membranous, caducous, concave, glabrous above, hairy below and on the margin or almost glabrous; pedicels 1-4 mm long, more or less flattened; bracteoles narrow-linear to narrow-lanceolate or oblanceolate, 3-4 mm long, 0.1-1 mm broad, caducous. *Calyx* 2-lipped, tube 3-3.5 mm long, obconic, about 2.5 mm diameter at throat, upper lip broadly ovate to almost circular, about 3.5 mm across, sometimes obscurely and shallowly 3-lobed, lower lip almost circular to oblong, about 3 mm across, entire or slightly emarginate, after flowering folding upwards against the upper lip to close the throat. *Corolla* white, purple-spotted in the throat, tube almost 7 mm long and 2 mm in diameter, expanding slightly towards the throat, upper lip deeply 2-lobed, lobes oblong, 3-3.5 mm long and 2-2.5 mm broad, entire, lower lip deeply 3-lobed, lobes broadly elliptic, more or less emarginate, middle lobe about 5 mm across, lateral lobes about 4 mm long and 3 mm broad. Lower *stamens* fertile, slightly exerted, filaments thick, about 3 mm long, attenuated upwards, attached at the throat of the corolla, anthers about 1 mm long, dorsifixed, connective prominent, without appendage, cells oblong, divergent, longitudinally dehiscent, stamens sterile, enclosed, reduced to slender filaments about 1 mm long, attached in the upper part of the corolla tube and bearing small club-shaped heads. *Ovary* deeply 4-lobed, style slender, gynobasic, shortly bifid. *Nutlets* very obliquely attached, ellipsoid, about 2 mm long and 1 mm diameter, the anterior usually slightly smaller, silvery, reticulate-pitted, minutely colliculate, the epidermis eventually separating from the nutlets. (Fig. 2).

Distribution

WESTERN AUSTRALIA: Eremaean Province, Austin and Coolgardie Districts: *A. M. Ashby* 2992, near Pindar, 3.ix. 1969 (AD, PERTH); 5222, half-way between Perenjori and the Inland Highway, 31.viii. 1975 (AD, B, CANB, E, G, GH, K, MEL, NT, PR); 5255, SW. of Paynes Find, 14.vi. 1975 (AD, CANB, MEL, PERTH). *W. E. Blackall* 697, Pindar, E. of Mullewa, 20.ix. 1931 (PERTH). *Y. Chadwick* 1839, 176 km from Mt Magnet on Geraldton Road, 15.viii. 1963 (PERTH). *A. J. Cough* 75, Mt Gibson, 9.ix. 1963 (PERTH). *H. Demarz* 30, 16 km S. of Paynes Find, 13.v. 1968 (PERTH, Kings Park); 4352, approx. 217 m.p. Paynes Find Rd, 20.viii. 1973 (Kings Park). *C. A. Gardner* 2616, near Pindar, 16.vii. 1931 (PERTH); 11992, Paynes Find, xi. 1951 (PERTH). *A. S. George* 4147, Niagara, near Kookynie, 30.viii. 1962 (PERTH). *A. W. Humphries* P29, 25 miles NE of Morawa, 16.ix. 1951 (PERTH). *K. Newbey* 2587, Niagara Dam, 13.ix. 1966 (PERTH). *G. M. Storr s.n.*, 12 miles NW of Wialki, 4.x. 1958 (PERTH). *J. Z. Weber* 4773, 1 km SW of Niagara Dam, c. 50 km NE of Menzies, 20.ix. 1975 (AD, CANB, K, MEL, NT); 4774, *ibid.* (AD, B, CANB, E, G, GH, MEL, NT, PR); 4802, c. 5 km W of Niagara Siding, c. 50 km NE of Menzies, 20.ix. 1975 (AD, CANB, MEL, NT). *E. Wittwer* 1348, 71 m Sandstone-Paynes Find Rd, 10.viii. 1974 (Kings Park). *J. Young s.n.*, near Mt Churchman, 27.x. 1875 (MEL 502314, 502315). (Fig. 4).

2. *W. schultzii* (F. Muell. ex Tate) Carrick, comb. nov.

Prostanthera schultzii F. Muell. ex Tate, Bot. Horn Exped. (1896) 173, basionym; [F. Muell., Cens. Austral. Pl. Suppl. 4 (1889) 4, nomen ("P. schulzii"); Sec. Cens. Austral. Pl. (1889) 169, nomen; Tate, Trans. R. Soc. S. Aust. 19 (1895) 82, nomen]; Ewart & Davies, Fl. N. Terr. (1917) 239.

Typus: *R. Tate s.n.*, "summit of Mount Sonder, June, 1894", MEL 43620, lectotypus hic designatus. All the material seen by Mueller and Tate is sterile. There is no evidence that Tate saw the Schwarz specimens in Melbourne. A portion of Tate's collection was sent to Mueller (MEL 43620) whose reply was quoted by Tate when the epithet was validated. The portion of Tate's collection seen by Mueller is therefore chosen as lectotype.



Fig. 2. *Wrixonia prostantheroides* F. Muell. 1, habit; 2, bract; 3, calyx after flowering; 4, corolla opened to reveal stamens; 5, front and back view of anther; 6, longitudinal section of fruit to show closed calyx; 7, nutlet.

Frutex intricate ramosus, usque ad 2 m altus, ramulis foliisque glabris, glandulis circularibus minutis dense omnino tectis. *Folia* petiolo 1-2 mm longo, conduplicato, amplexicauli, inter nodos decurrenti, lamina fere orbiculari, 4-8 mm diametro, crassa, concolora, integra vel interdum retusa, margina incrassata. *Inflorescentia* terminalis, perbrevis pedunculata, spiciformis, vix 1 cm longa lataque, constans ex 10-16 floribus sessilibus decussatis spississimis superpositis. Bractea late obovata, truncata, concava, membranacea, margine integra, 3-4 mm longa, 2.5-3 mm lata, extus pilis brevibus albis crispis in dimidio inferiore tecta, intus glabra. Bracteolae duo basi calycis affixae, membranaceae, anguste oblanceolatae, circa 2 mm longae, 0.5 mm latae, extus pilis parvis tectae, intus glabrae. *Calyx* bilabiatus, glandulis circularibus minutis sparse tectus:



Fig. 3. *Wrixonia schultzei* (F. Muell, ex Tate) Carrick. 1, habit; 2, bract; 3, flower at anthesis; 4, corolla opened to reveal stamens; 5, front and back views of anther; 6, longitudinal section of fruit; 7, nutlet.

tubo circa 2 mm longo, obconico, labiis latis truncatis imbricatis integris vel interdum sinuatis; labio inferiore circa 1.5 mm longo, 3.5 mm lato; labio superiore circa 2 mm longo, 5 mm lato. *Corolla* alba, glabra; tubo cylindrico, circa 4 mm longo, 1 mm diametro, fauce ampliato, lobis plus minusve patentibus; labio superiore circa 2 mm longo, 4 mm lato, bilobo, lobis integris; labio inferiore trilobo, lobo medio circa 3 mm longo latoque, submarginato, prope medium 2 maculis purpureis et faucem luteum versus 4 maculis elongatis luteis praedito, lobis lateralibus integris, circa 2.5 mm longis, 2 mm latis, quoque 1 macula purpurea prope angulum inferiorem interiorem praedito sed sine maculis luteis. *Stamina* inferiora duo fertilia, exserta, fauce inserta, filamentis crassis, circa 3 mm longis, antheras versus attenuatis, antheris ellipticis, 0.7 mm longis, 0.5 mm latis, dorsifixis, sine appendiculis, longitudinaliter dehiscentibus; stamina superiora duo sterilia, inclusa, filamentis gracilibus, circa 1 mm longis, claviformibus, sine antheris. *Ovarium* profunde lobatum, stylo gynobasico, tenui, circa 7 mm longo, breviter bifido. *Nuculae* oblongae, 2 mm longae, 1 mm latae, bruneolae, reticulatae, valde oblique affixae.

Ob materiam exiguam sterilemque typi, hanc descriptionem atque tabulam a materia Maconochiei 1653 paravi.

Intricately branched shrub up to 2 m high, branchlets and leaves glabrous, densely covered with minute circular glands. *Leaves* petiolate, petiole 1-2 mm long, conduplicate, clasping, decurrent, lamina almost circular, 4-8 mm diameter, thick, concolorous, entire or sometimes retuse, margin thickened. *Inflorescence* terminal, very shortly pedunculate, spicate, scarcely 1 cm long and broad, consisting of 10-16 decussately arranged, closely overlapping, sessile flowers; flower subtended by a broadly obovate, truncate, entire, concave, membranous bract, 3-4 mm long, 2.5-3 mm broad, clothed with short, white, curled hairs on the lower half outside, glabrous inside; bracteoles attached at the base of the calyx, narrowly oblanceolate, membranous, about 2 mm long, 0.5 mm broad, sparsely hairy on the outside, glabrous inside. *Calyx* two-lipped with a few circular glands outside, tube obconical, about 2 mm long, lips broad, truncate, imbricate (the upper overlapping the lower), entire or sometimes sinuate, lower lip about 1.5 mm long, 3.5 mm broad, upper lip about 2 mm long, 5 mm broad. *Corolla* white, glabrous, tube cylindrical, about 4 mm long, 1 mm diameter, expanding at the throat, lobes of the lips spreading, upper lip about 2 mm long, 4 mm broad, 2-lobed, lobes entire, lower lip 3-lobed, middle lobe about 3 mm long and broad, slightly emarginate, near the middle provided with 2 purple spots and towards the yellow throat with 4 elongated yellow spots, lateral lobes entire, about 2.5 mm long, 2 mm broad, each provided with 1 purple spot near the lower interior angle, but without yellow spots. Lower *stamens* fertile, exserted, attached at the throat, filaments thick, about 3 mm long, attenuated upwards, anthers broadly elliptical, 0.7 mm long, 0.5 mm broad, dorsifixed, without appendages, opening in longitudinal slits, upper stamens sterile, included, filaments slender, about 1 mm long, club-shaped, without anthers. *Ovary* deeply 4-lobed, style gynobasic, slender, about 7 mm long, shortly bifid. *Nutlets* oblong, 2 mm long, 1 mm broad, pale brown, reticulate, very obliquely attached. (Fig. 3).

Distribution

NORTHERN TERRITORY: Mount Sonder: *A. C. Beauglehole* 27455, 22.ix. 1968 (BEAUGLEHOLE, AD). *G. Chippendale* s.n., 10.ix. 1958 (NT 4836, AD, BRI, CANB, K, MEL, NSW, PERTH). *J. R. Maconochie* 1650, 1653, 5.x. 1972 (NT, AD). *W. F. Schwarz* s.n., 1886 (MEL 43619, 43621). *R. Tate* s.n., Horn Expedition, 27.vi. 1894 (AD 97601077, MEL 43620). *J. H. Willis* s.n., 20.vii. 1966 (MEL 43617). (Fig. 4).

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Fig. 4. Distribution of *Wrixonia prostantheroides* (dots) and of *W. schultzei* (triangle).